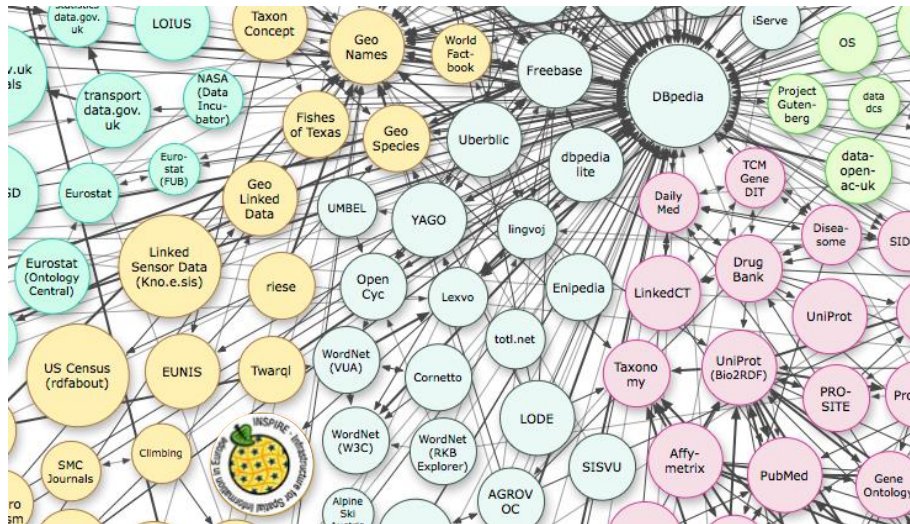


RDF – an alternative encoding for INSPIRE data?

Michael Lutz

Geodata on the Web Conference
Amersfoort, 10 February 2016



www.jrc.ec.europa.eu

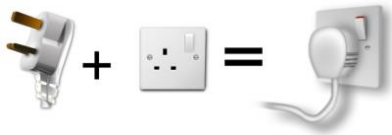
*Serving society
Stimulating innovation
Supporting legislation*

Content

- INSPIRE in a nutshell
- Why another encoding?
- The ARE3NA RDF guidelines and pilots

INSPIRE in a nutshell

- INSPIRE provides a comprehensive framework for interoperability of spatial data
 - Inventory (monitoring of implementation)
 - data & service sharing
 - data & service discovery (metadata)
 - network services
 - data interoperability



- INSPIRE data can be combined with other data to enable cross-sector & cross-border “location-aware” analyses

Key pillars of data interoperability

Conceptual data models

- spatial objects and their properties and relationships for 34 data themes
- cross-domain harmonization
- based on a common modelling framework
- managed in a common UML repository

Encoding

- GML application schemas as standard encoding
- conceptual models independent of concrete encodings
- also possible to derive other encodings (e.g. based on RDF)

Harmonised vocabularies

- to overcome interoperability issues caused by free-text and/or multi-lingual content
- allow more specific terms from local vocabularies in addition to the harmonized terms

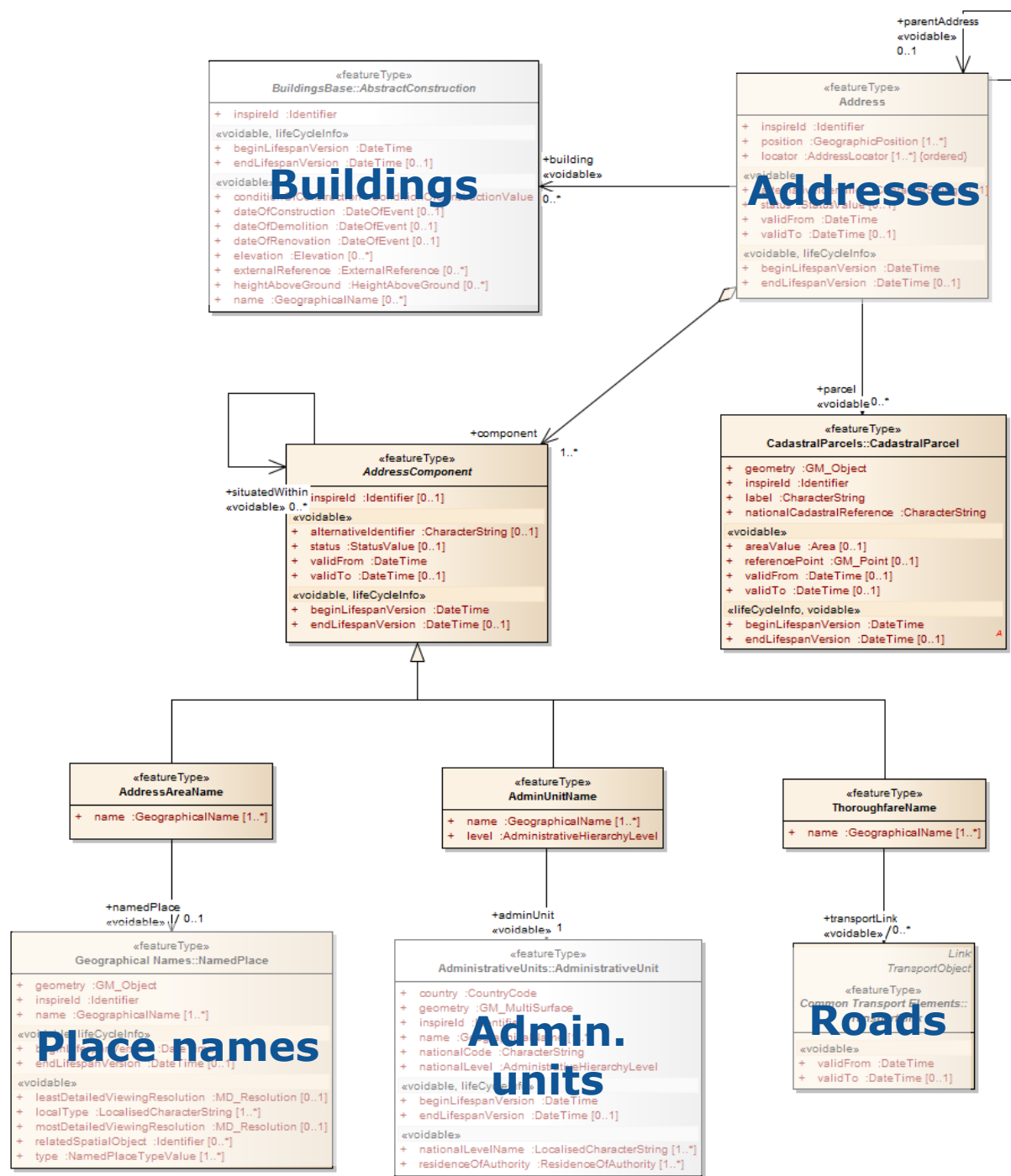
Registers

- provide unique and persistent identifiers for resources
- allow their consistent management and versioning
- items can be made unique and referred to unambiguously

Data models

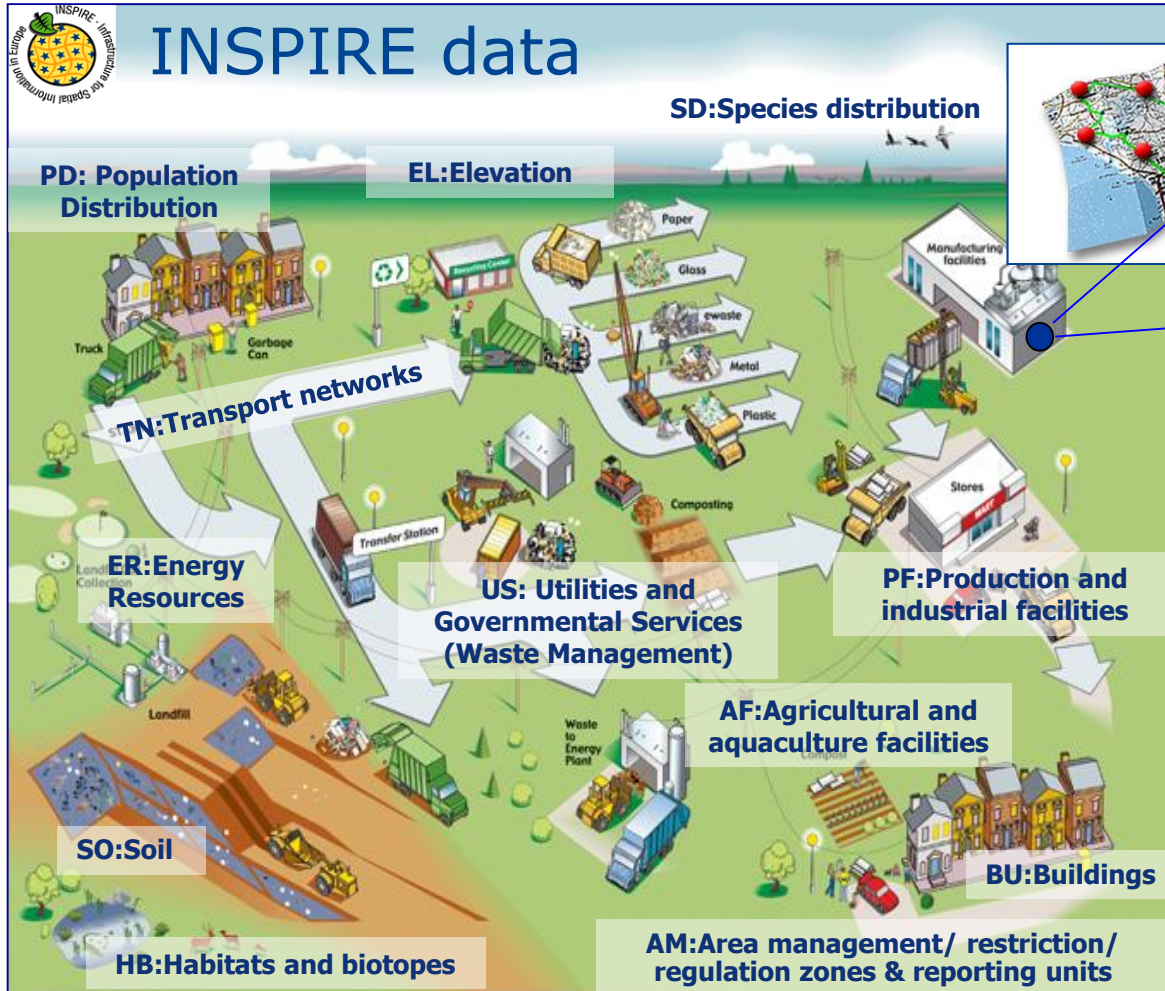
Conceptual data models

- spatial objects and their properties and relationships for 34 data themes
- cross-domain harmonization
- based on a common modelling framework
- managed in a common UML repository



Cross-sector/-border interoperability

Data from other sectors



		Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Mean	Standard Deviation
energy		0.0	1.0	0.5	0.289	0.0	1.0	0.5	0.289	0.0	1.0	0.5	0.289
health		0.0	1.0	0.5	0.289	0.0	1.0	0.5	0.289	0.0	1.0	0.5	0.289
emissions		0.0	1.0	0.5	0.289	0.0	1.0	0.5	0.289	0.0	1.0	0.5	0.289

Smart cities

Environmental Impact Assessment

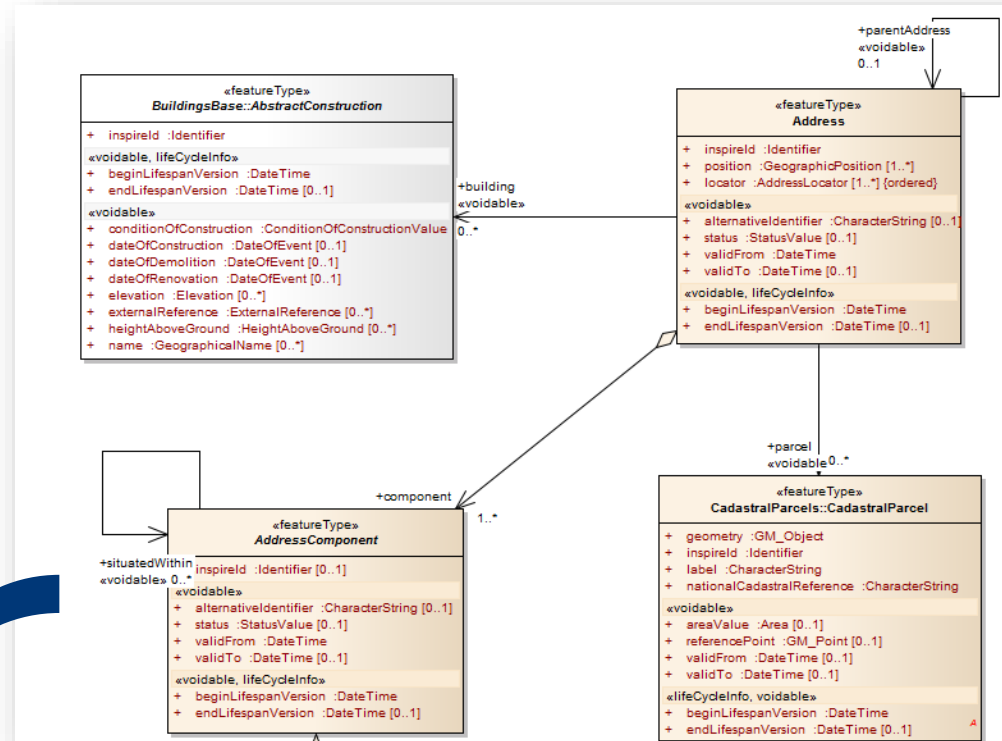
Risk Management

...

Encoding rules

Encoding

- GML application schemas as standard encoding
- conceptual models independent of concrete encodings
- also possible to derive other encodings (e.g. based on RDF)



ARe³NA

A Reusable INSPIRE Reference Platform



Interoperability



Openness



Reuse



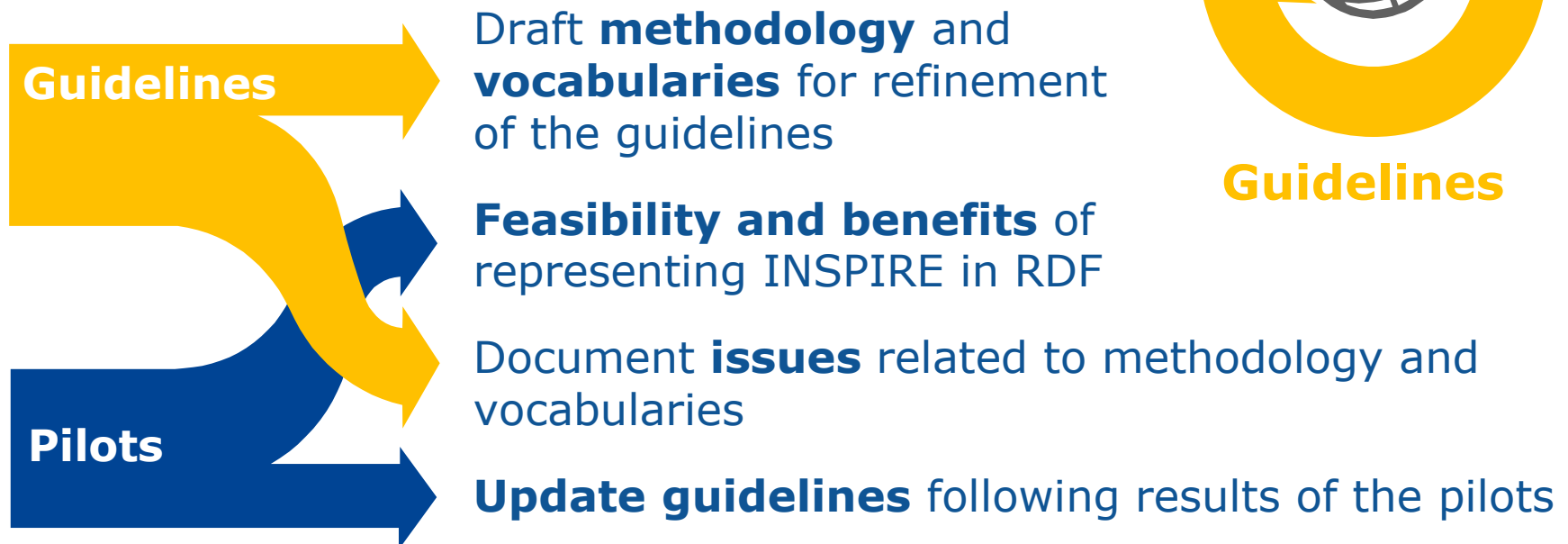
Collaboration

... sharing reusable components for **INSPIRE** implementation and interoperability in cross-border/cross-sector contexts

ARE3NA work on INSPIRE as Linked Data

Objectives

- Improve the guidelines for publishing INSPIRE data in RDF
- Elaborate the value propositions of geospatial data as linked open data



Pilots – Tell us more about ...



Tools: Are you planning to use [existing software](#) tools for the implementation of the pilot that other organisations could use in similar activities?



Data: Are you planning to reuse [existing vocabularies](#)? Which [INSPIRE data](#) would the pilot use? Are there any [access](#) or [licensing](#) restrictions to the data?



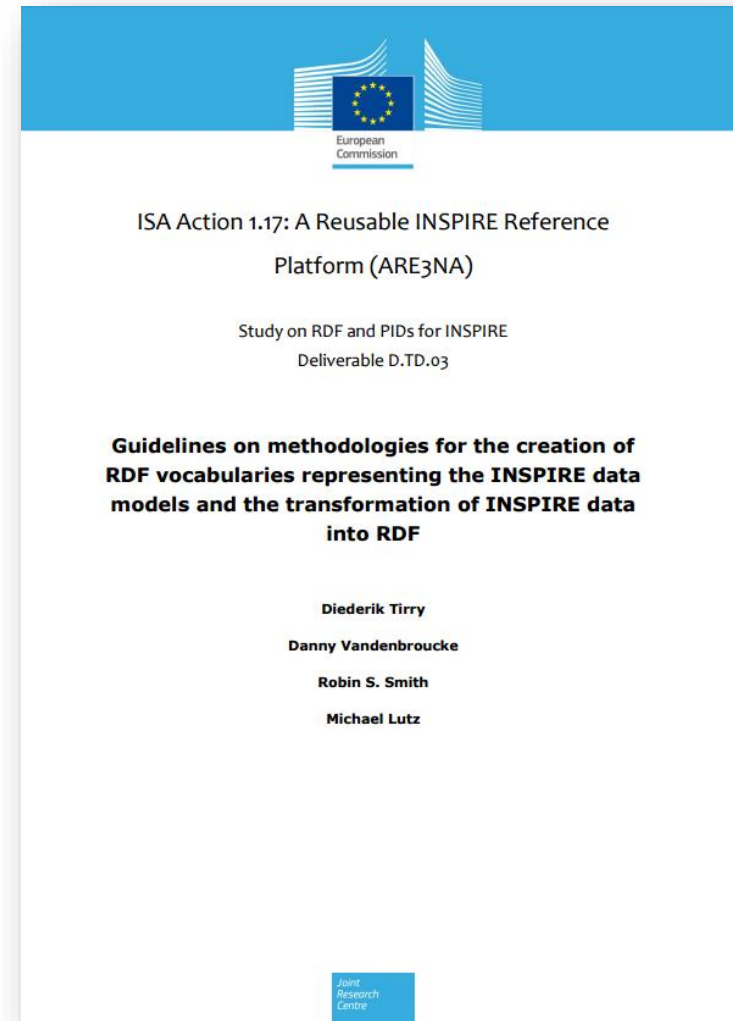
Use cases: Which [problems](#) will the pilot address? What is the [policy](#) context? Which [challenges](#) do you foresee? Who is your target [audience](#)? What [added value](#) would the pilot bring?



Data consumers: What are the [benefits](#) of using RDF/Linked Data for the consumers? What are their specific [data requirements](#)? Which [other parties](#) would be involved in the pilot?

Guidelines

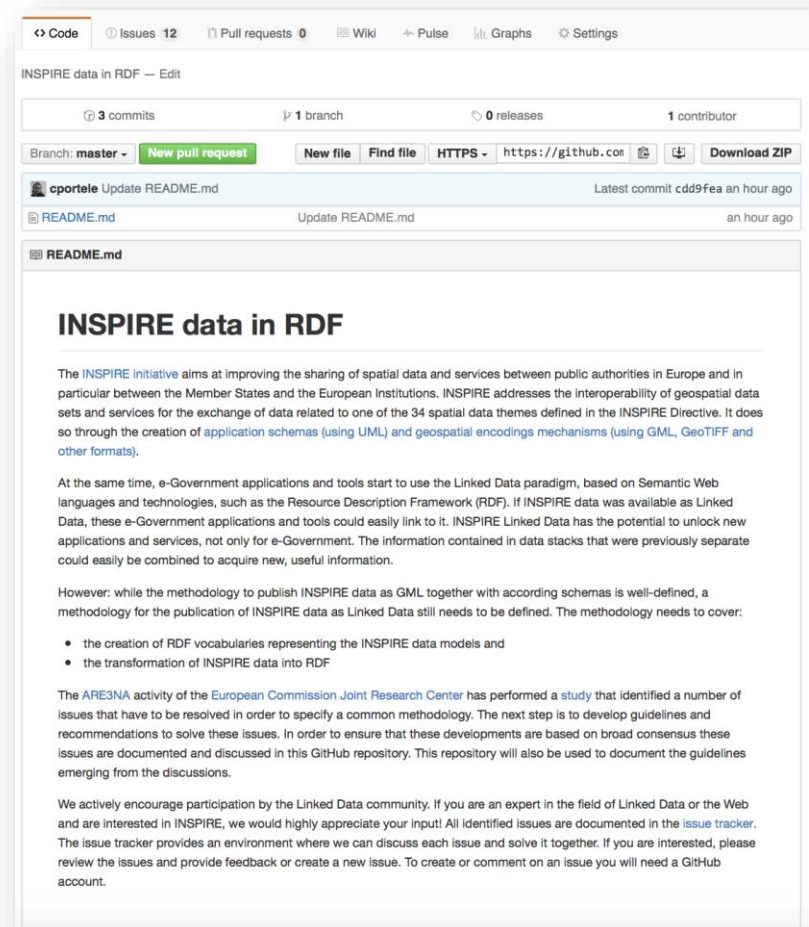
- Build on the results of a previous ARE3NA project (2014)
- Focus on open issues
- Consider new input
- Goal is a draft for a new encoding rule for INSPIRE data, ready for stakeholder review
- Scope focused on themes used in pilots



https://joinup.ec.europa.eu/sites/default/files/are3na-rdf_vocabulary_guidelines_final.pdf

Feedback on open issues on GitHub

- GitHub repository for discussing and resolving open issues
- Starting point: known open issues incl. a proposal for resolution
- Comments and ideas from stakeholders and experts working on related activities welcome!
- Also the emerging guidelines and proposed INSPIRE RDF vocabularies will be documented in the repository



The screenshot shows the GitHub repository page for 'INSPIRE data in RDF'. The repository has 3 commits, 1 branch, 0 releases, and 1 contributor. The current branch is 'master'. A recent commit by 'cportele' updated the README.md file. The README content is as follows:

INSPIRE data in RDF

The INSPIRE initiative aims at improving the sharing of spatial data and services between public authorities in Europe and in particular between the Member States and the European Institutions. INSPIRE addresses the interoperability of geospatial data sets and services for the exchange of data related to one of the 34 spatial data themes defined in the INSPIRE Directive. It does so through the creation of application schemas (using UML) and geospatial encodings mechanisms (using GML, GeoTIFF and other formats).

At the same time, e-Government applications and tools start to use the Linked Data paradigm, based on Semantic Web languages and technologies, such as the Resource Description Framework (RDF). If INSPIRE data was available as Linked Data, these e-Government applications and tools could easily link to it. INSPIRE Linked Data has the potential to unlock new applications and services, not only for e-Government. The information contained in data stacks that were previously separate could easily be combined to acquire new, useful information.

However: while the methodology to publish INSPIRE data as GML together with according schemas is well-defined, a methodology for the publication of INSPIRE data as Linked Data still needs to be defined. The methodology needs to cover:

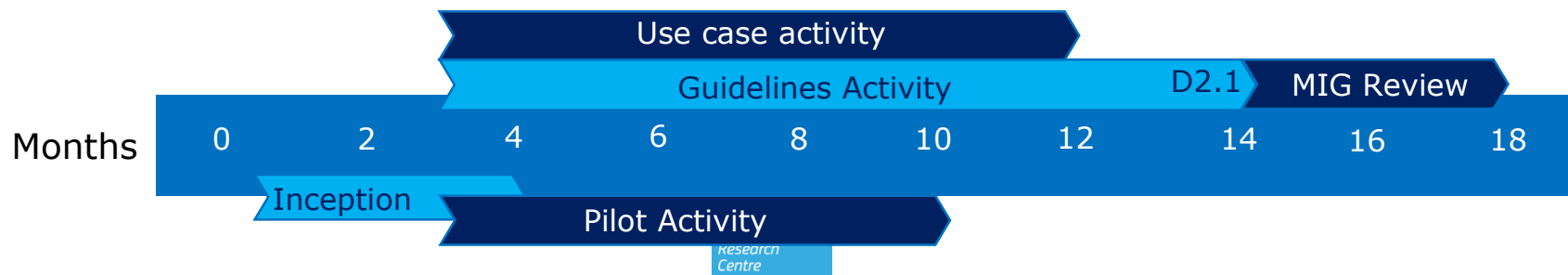
- the creation of RDF vocabularies representing the INSPIRE data models and
- the transformation of INSPIRE data into RDF

The ARE3NA activity of the European Commission Joint Research Centre has performed a study that identified a number of issues that have to be resolved in order to specify a common methodology. The next step is to develop guidelines and recommendations to solve these issues. In order to ensure that these developments are based on broad consensus these issues are documented and discussed in this GitHub repository. This repository will also be used to document the guidelines emerging from the discussions.

We actively encourage participation by the Linked Data community. If you are an expert in the field of Linked Data or the Web and are interested in INSPIRE, we would highly appreciate your input! All identified issues are documented in the issue tracker. The issue tracker provides an environment where we can discuss each issue and solve it together. If you are interested, please review the issues and provide feedback or create a new issue. To create or comment on an issue you will need a GitHub account.

Timeline

- **Inception** activity (01-04/2016): definition of the forum, pilot selection
- **Pilot** activity (03-10/2016): scoping, support pilot participants and monitoring
- **Guideline** activity: document known open issues on GitHub (01-02/2016), resolve open issues, create and test RDF vocabularies in pilots, document guidelines, engage with experts and stakeholders (02-12/2016), test INSPIRE as Linked Data in Pilots (02-09/2016), Review of draft guidelines by INSPIRE MIG (02-05/2017)
- **Use Case** activity (03-12/2016): use case identification
- **Review** (03-06/2017): advice to JRC to help resolve any comment obtained



Get involved!

- Propose pilots



- Comment on GitHub



- Connect to your MIG-T representative

- Send feedback on “food for thought” to are3na@jrc.ec.europa.eu
(or talk to us during the lunch break)



Food for thought...

- Do we really need this?
- Do we need it for all of INSPIRE?
- Where do the real benefits lie (for whom)?
- Do we need to change our SOA architecture?

